Neural Notes

Visual Exploration of Songs using AI Content-Based Embeddings

Team - Madeleine Bulkow, Kuangwei Huang, Weixing Sun

The recorded music industry has experienced a revival in the past 3 years of consecutive growth both in the U.S. and globally, after period of precipitous decline of physical media sales since 2000. This is turnaround is predominantly driven by the growth of streaming services, in particular paid subscription services, and global streaming revenue accounted for almost half (47%) of global revenue, and paid subscription grew globally by +32.9% in 2018. One of the most important value propositions for subscription services is the ability to offer personalized content delivery and enable "discovery" of new music which tailored to subscribers' preferences. These historically relied on content-agnostic collaborative filtering techniques which are known to suffer from cold-start problems. There is ongoing research into using new deep learning techniques from the rapidly advancing image recognition and natural language processing fields to improve on content-based music recommendations, and our project will be looking into developing new methods and techniques to further this body of research.

Neural Notes is an interactive 3D visualization app for music lovers to do self-directed song discovery with content-based recommendations using artificial intelligence and deep learning.

Tags: spectrograms, CNN, image recognition, transfer learning, embeddings generation, clustering and non-linear dimensionality reduction with T-SNE, visualizations using Dash, hosted on Google App Engine.

Links:

Informational Webpage http://people.ischool.berkeley.edu/~weixing/w210_website_v2.1/

Neural Notes Web App https://neural-notes.appspot.com/

UC Berkeley ISchool Project Page https://www.ischool.berkeley.edu/projects/2019/neural-notes

Github Repo https://github.com/kuangweihuang/MIDS_w210_capstone_mb_kh_ws

Final Presentation Slides in pdf
https://github.com/kuangweihuang/MIDS_w210_capstone_mb_kh_ws/blob/master/MIR_Proj_Week14-Final.pdf

Instructions for installation of Web App on local machine:

https://github.com/kuangweihuang/MIDS_w210_capstone_mb_kh_ws/tree/master/neural_notes_web_app

Neural Notes

Visual Exploration of Songs using AI Content-Based Embeddings

1. Running Neural Notes on Google App Engine

- Visit the link: https://neural-notes.appspot.com/

2. Running Neural Notes on your localhost

- Clone this GitHub repo:

  https://github.com/kuangweihuang/MIDS_w210_capstone_mb_kh_ws/tree/master/neural_notes_web_app

- Navigate to this directory on your local machine
- Activate the virtual environment using the following bash command:

  ```
  $ source venv/Scripts/activate
  ```

- Launch a python server with the Flask app `main.py`:

  ```
  $ python main.py
  ```

- Open a web browser (either Firefox or Chrome) and paste in the `http://` address in the bash prompt:

  ```
  $ http://127.0.0.1:8050/
  ```

Note:

There are two versions, the original `main.py` version and a separate version with some famous songs fit into the embedding space `main_w_famous.py`. Simply rename the desired version to be main.py and run the code above.